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Gate-defined quantum dot devices in undoped Si/SiGe heterostructures for spin qubit applications[1] CHRISTIAN VOLK, FREDERICO MARTINS, CHARLES M. MARCUS, FERDINAND KUEMMETH, Center for Quantum Devices, Niels Bohr Institute, University of Copenhagen, 2100 Copenhagen, Denmark — Spin qubits based on few electron quantum dots in semiconductor heterostructures are among the most promising systems for realizing quantum computation. Due to its low concentration of nuclear-spin-carrying isotopes, silicon is of special interest as a host material. We characterize gate-defined double and triple quantum dot devices fabricated from undoped $Si/Si_{0.7}Ge_{0.3}$ heterostructures. Our device architecture is based on integrating all accumulation and depletion mode gates in a single gate layer. This allows us to omit the commonly used global accumulation gate in order to achieve a more local control of the potential landscape in the device. We present our recent progress towards implementing spin qubits in these structures.

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Christian Volk
Center for Quantum Devices, Niels Bohr Institute, University of Copenhagen, 2100 Copenhagen, Denmark

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